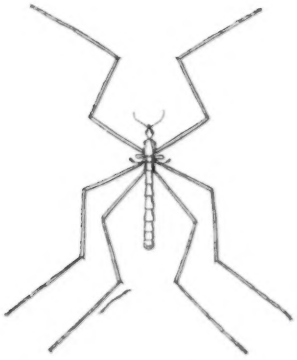
DECEMBER, 1906.

ENTOMOLOGICAL NEWS

Vol. XVII. No. 10



Limnophila aspidoptera Coquillett.

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PHILADELPHIA:
ENTOMOLOGICAL ROOMS OF
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.

Entered at the Philadelphia Post-Office as Second-Class Matter.

ENTOMOLOGICAL NEWS

Published monthly, **excepting July and August,** in charge of the Entomological Section of the Academy of Natural Sciences, Philadelphia, and the American Entomological Society.

ANNUAL SUBSCRIPTION, $1.00 IN ADVANCE.

Outside of the United States and Canada, $1.20.

Advertising Rates: 30 cents per square inch, single insertion; a liberal discount on longer insertions. No advertisement taken for less than 60 cents—Cash in advance.

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ENTOMOLOGICAL NEWS

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PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XVII. DECEMBER, 1906. NO. 10.

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Some notes on the Dragonflies of Waterloo, Iowa.

BY NEWTON MILLER, Thorntown, Iowa.

Waterloo is situated in the northeastern part of Iowa on the Red Cedar River. This region in general is level and dotted with ponds and sloughs. One of these sloughs extends along the northern edge of Waterloo around in a northwesterly direction for about a half mile, with a maximum width of about 175 or 200 yards. Its southern end communicates with the river, and its northern end terminates in more or less isolated ponds which extend almost to the river. During high water a large quantity of water from the river finds its way through this slough. Entering the slough, near town from the east, is a small stream six or eight feet wide. In and about this slough is a rank growth of wild rice, flags, cattails and smaller species. Around the northern end is a grove of small trees.

Such conditions are typical of a great number of places within a radius of a few miles of Waterloo. Those farther away from the river have in most cases no trees about them.

Red Cedar River, where it flows through Waterloo, is about 75 yards wide and is shallow for a river of its width. In the

vicinity of Waterloo its banks usually have an abundance of willows, while its course is narrowly margined by small timber. Dragonflies were very scarce along the river, but I was told they became abundant later in the summer.

South of Waterloo is Elk Run, a small stream some 20 to 30 feet wide, which empties into Red Cedar River about six miles below the town. Some trees grow along its course, and my collection along it was made in an open woods. Its bed is composed mostly of sand.

A short distance to the northeast of the mouth of Elk Run is a slough that has no trees or shrubs about it. This slough is in a pasture tract of land and the cattle keep the vegetation well eaten off, especially during the dry summer months, when a large portion of the slough goes dry leaving only a string of isolated ponds.

The dragonfly season did not open in the locality of Waterloo until after June 1st. However, a very few specimens of *Anax junius* and *Ischnura verticalis* were seen as early as May 20th. By the time dragonflies began to fly I had only one day and parts of two more to devote to the collection of Odonata. There had been four consecutive warm days previous to June 7th, on the afternoon of which I made my first collection. This hot, clear afternoon I collected about the slough north of Waterloo, especially that portion near the edge of town. Seventy-eight specimens were taken. The next morning, June 8th, which was hot and clear, I collected about the northern portion of the same slough, taking between 170 and 180 specimens.

The following day collections were made along Elk Run in the morning and about the slough near the mouth of Elk Run in the afternoon. The morning for the most part was clear, but shortly before noon it clouded up and by 2.30 o'clock it was so cloudy and windy that I had to give up my collecting. The high winds of this region are no little handicap to the insect collector. The result of my morning's work along Elk Run was more than 120 specimens. *Calopteryx æquabilis* was abundant along the banks in shady places. Those taken in the afternoon around the slough were for the most part small

species which had taken shelter in the grass from the wind and which I bagged by walking against the wind, dragging my net through the grass. *Ischnurà verticalis*, *Nehalennia irene* and *Enallagma hageni* were abundant here.

Many of my specimens are tenerals, which were very abundant around the sloughs. The rapidity with which three or four warm days were bringing out the dragonflies would indicate that these sloughs would be teeming with dragonfly life in a week or so of warm weather.

The following is a list of the species of my collection as determined by Mr. E. B. Williamson:

Calopteryx maculata Beauvois. Nine males, seven females, open woods along Elk Run; quite abundant.

Calopteryx æquabilis Say. Twenty-five males, 23 females; open woods along Elk Run in shady places. These 48 specimens were taken in less than two hours.

Hetærina americana Fabricius. One male from the slough near the mouth of Elk Run.

Lestes unguiculatus Hagen. Ten males, nineteen females; abundant about slough near mouth of Elk Run.

Lestes forcipatus Rambur. Two males.

Lestes rectangularis Say. Five males, 1 female; scarce, just emerging; slough north of Waterloo.

Lestes uncatus Kirby. Thirteen males; 14 females; abundant about slough near mouth of Elk Run.

Nehalennia irene Hagen. Twenty-one males; 15 females; very abundant about slough near Elk Run. This species was found near the ground or water in the grass where it had probably taken shelter from the wind.

Amphiagrion saucium Burmeister. Two males from the slough at north edge of Waterloo.

Enallagma hageni Walsh. Ninety-five males; 15 females; individuals of this species more numerous than any of the other 27 species; most abundant about slough near mouth of Elk Run.

Enallagma ebrium Hagen. Six males from the slough north of Waterloo.

Enallagma antennatum Say. Thirteen males; seven fe-

males; common about slough north of Waterloo and the one near mouth of Elk Run.

Ischnura verticalis Say. Twenty-eight males; 21 females; abundant about the sloughs at Elk Run and north of Waterloo. This was one of the earliest species out. A few individuals were seen at least two weeks before other species, except *Anax junius*, appeared in any numbers.

Anomalagrion hastatum Say. One male.

Gomphus fraternus Say. Two females.

Gomphus cornutus Tough. One female in poor condition, not fit for description, probably belongs here though the female has not been described.

Gomphus sp.? Two females. These are teneral, and Mr. Williamson hesitates to give them a specific name.

Anax junius Drury. Two males; 2 females; common about woods and slough north of Waterloo. One of the earliest, species out in the spring. As many were seen patroling the open woods as about the water.

Nasiæschna pentacantha Rambur. A male and a female from slough north of Waterloo.

Macromia illinoiensis Walsh. Three males and one female, from slough north of Waterloo.

Tetragoneuria cynosura Say. Nine males, three females; taken late in the afternoon along the bank over the water in the shade near the edge of Waterloo.

Epicordulia princeps Hagen. Fifteen males, 22 females; found in great numbers at north end of slough at Waterloo. They were perched lengthwise on branches and twigs in the sun. Frequently several would be strung along on a drooping twig close together so that three to five could be taken with a single stroke of the net. All were recently emerged.

Leucorhinia intacta Hagen. Five males, 2 females.

Mesothemis simplicicollis Say. A male and a female.

Pachydiplax longipennis Burmeister. Nineteen males, seven females; very abundant about slough north of Waterloo. Found perched above the water with wings drooped, getting the full benefit of the sun.

Libellula basalis Say. Scarce; two males, taken from weeds

a short distance from the water's edge at the slough north of Waterloo.

Libellula pulchella Drury. Sixteen males; four females; abundant about sloughs at Elk Run and north of Waterloo. Females found about the water only when they came to oviposit.

Plathemis lydia Drury. Nine males, four females; common about the mouth of the little stream in slough near edge of Waterloo.

Texas Notes.—III.

By E. Dwight Sanderson.

The Chinch Bug in Texas.

But little has been written concerning the common chinch bug (*Blissus leucopterus*) in the Gulf States. In endeavoring to devise means for its control in Texas several notes of general interest were made.

The region affected by the chinch bug in Texas is largely coextensive with the grain belt, but injury occurs south into the central part of the State as far as Brazos County, about 125 miles north of the Gulf. South of this we received no complaint of damage. The adult bugs hibernate over winter in fields of small grain, in the stalks and stubble of corn, under bark of logs, and seemingly in any sheltered situation. We have found them numerous in the hollows made in the stem of the bull nettle (*Solanum rostratum*) by the little beetle *Trichobaris texana*. They emerge in March or April according to the season. In 1903 they were first noticed in north Texas the second week in April. At College Station they were numerous on the 20th, but oviposition did not take place until about May 1. In 1904, the season being unusually early, straggling specimens were observed at College Station March 7th. On March 30th they were common on volunteer sorghum, though none on corn, and first copulation was observed. In 1903 the first young nymphs were observed May 8. On May 21 the first instar was still most abundant, though a few in the second instar were found. June 4 some had reached the

so-called pupa stage, though a large proportion were still in the first instar.

June 11, 1903, the first adults of the new brood were found and most of the nymphs were ready to transform. The first eggs were laid April 2, 1904, as far as observed in the field. On April 23 a few nymphs in the second instar were observed. Nymphs in all instars were secured April 28, but no eggs. On May 14 nymphs in the second and fourth instars were observed and hibernated adults were very scarce. The spring rains caused a high mortality this season and further observations are lacking. Prof. Webster (Bulletin 15, Bureau Entomology, pg. 19) quotes Dr. Shimer as stating that the adult develops 57 to 60 days after the deposition of the eggs. Though the above data are not conclusive, yet from the field observations it is evident that the development from oviposition takes place in at least 45 days and possibly less. A second generation seriously damages sorghum and late planted Mexican June corn in July and August. I have no recorded observations concerning a third brood, but am quite certain that a third generation is developed before hibernating for the winter.

The habits and injury done by the bugs are quite variable, making their control much more difficult than further north. When the adults emerge from hibernation in March or April they may fly directly to the young corn just appearing above the ground. They are frequently observed flying or alighting on horses at this season. Furthermore, they will often be found in spots here and there over a large field of corn. In other instances, however, they seem to remain mostly on oats and wheat, so that when the latter are cut in June they migrate to corn as further north.

Upon the young corn from a half dozen to as many as thirty will be found on a hill in which the plants are not three inches high. In many cases replanting in spots is necessary. The most serious injury is done by the adults of the next generation late in May or early June, when the corn is about knee or waist-high. Having bred in the corn field and not migrating to it, as a rule, as in the North, the bugs are very abundant over the entire corn field. The usual methods of control prac-

tised in the North to prevent migration are therefore inapplicable. In other cases, however, the first generation develops on small grains, more particularly spring oats, and migrates when they are cut to corn, which is then badly injured. Millet and sorghum seem to be favorite food plants, and we believe if properly handled might be used as catch or trap crops, as some preliminary experiments made in 1904 and the experience of practical farmers indicated.

Needless to state, in Texas as elsewhere, injury is the worst in dry seasons. In 1901 and 1902 the drouth and chinch bugs caused a well-nigh total failure of the corn crop of northern Texas. Old residents who moved to Texas from Illinois where they had known the chinch bug have stated that the pest was injurious forty years ago, though possibly more so, as the land has been brought entirely under cultivation.

Although no entirely successful remedial measures were discovered for the control of the first generation on corn in the spring, some proved so promising that they are worthy of record.

Both young corn plants but a few inches high, and those nearly ready to tassel, were sprayed with an emulsion made with three gallons of crude Beaumont oil, 1½ pounds of soap, emulsified and diluted with a barrel of water, thus giving about 6.6 per cent. of oil. This was fatal to all bugs hit and did no injury to the plants. As Beaumont oil is very much cheaper than kerosene, emulsions made with it are worthy of trial for other purposes in the southwest. Though all the bugs upon the young plants might be killed by the spraying, yet in a day or two others would arrive and thus to be effectual the spraying would need to be repeated, which is hardly possible on large acreages. For the older corn the spraying, if the bugs are abundant enough to threaten serious injury, is more feasible and profitable.

It was noticed that when the hibernated bugs migrated to corn in the early spring they were much more abundant upon fields which had been cultivated and the earth was in clods. Where the soil had been packed tightly around the plants by rains and had not been loosened there were few bugs.

This was also true to a certain extent in oat fields. Clearly the bugs preferred a soil with numerous cracks in which they might hide and oviposit. This being the case, it seemed probable that if a liberal application of tobacco dust were applied to each hill of corn they might be driven off. Field experiments were therefore instituted to test the value of this remedy. It was found that where strong winds did not blow the dust away the bugs were almost entirely killed by it, a dozen or so being found dead at each hill. Usually in about an hour after application the bugs remaining at the hill were stupefied. The action of the tobacco dust on these insects is rather unique, being comparable to a moth flying to its death in a flame, for both are the result of tropisms.

The chinch bug seems to be very clearly and decidedly stereotropic, to use the term coined, I believe, by Prof. Jacques Loeb. Possibly they are also geotropic, but this is not so clear. In other words, the chinch bug has an instinctive attraction for a crevice or coarse loose soil. This is incidental with the oviposition of the hibernated brood. Neither geotropism or negative heliotropism seem to explain the phenomena. That an insect should so instinctively remain in a substance which soon causes its death, and the odor of which is enough to drive many insects from plants, seemed so unusual that some laboratory experiments were made to further show this point. May 3, 1903, Mr. Wilmon Newell placed 27 adult bugs in a box and covered with tobacco dust. After two and one-half hours the dust was removed, none having escaped, though they might easily have done so, the box being uncovered and the dust shallow; of the 27 but 7 revived. Thirty bugs were similarly placed under tobacco dust the same day for three hours, but one of them reviving. Twenty-one bugs were placed in a small box and covered a half inch deep with tobacco dust. Three crawled out. Four others crawled to the surface, two remaining upon it and two crawling back in the dust. At fifteen minutes all were stupefied. At end of seventeen minutes three bugs were removed from the box and placed on the table. In sixty minutes one crawled off, and in eighty minutes another revived. Twenty-two minutes after the experiment was started, five

were removed; eighty minutes later two crawled off: twelve hours later all had revived, though some were still stupid. At the end of thirty-two minutes, five more were taken from the box; one hour later one crawled off, and thirty-six hours later two were found dead; at forty-seven minutes six were removed. Four of these were dead thirty-six hours later.

Again, to show the attraction of the loose dust or soil for the bugs, for they would undoubtedly crawl into sawdust equally readily, ten bugs were placed on the surface of a half inch of tobacco dust. All crawled into it at once. Three subsequently crawled out and away. None remained on the surface, though near it. In ten minutes all were stupefied and were removed and exposed to air. Some of these had recovered ninety minutes later and all revived in a few hours.

Thus the bugs crawl into the tobacco and remain there, where they are stupefied by its fumes sometimes in ten minutes. If allowed to remain forty-five minutes, two-thirds at least are killed. As a matter of fact, where a pile of tobacco dust remained undisturbed around a plant the mortality would be almost entire, for as soon as stupefied the bugs would remain in it undisturbed. However theoretically plausible the method may seem, it will not be practicable in Texas owing to the constant strong winds, which soon scatter the dust. Its action on the bugs is, however, of interest, and might be put to practical use in the case of the false chinch bug, which has very similar habits when working on garden vegetables.

The best means of control for the chinch bug in Texas, and one which practical farmers have found satisfactory through their own experiments, is the destruction of all corn and sorghum stalks or stubble left in the field and the general cleaning up of all places favorable for hibernation as far as possible. Sorghum stubble seems a particularly favored place of hibernators. Especially is this necessary where sorghum and June corn are grown late in the summer and early fall, thus furnishing abundant succulent food for the later generations, and the volunteer plants forming food in early spring. Indeed, to these late fodder plants may be largely attributed the destructive numbers of the chinch bug in early spring upon young

corn, and injury seems to be the more general where they are most grown. The practical control of this pest in Texas offers one of the most interesting and valuable problems to the economic entomologist, which must be solved by demonstrating the general methods of culture which will control the pest as has been done so effectively with the cotton pests.

Conocephalus lyristes.

By James A. G. Rehn.

Early in the year 1905 the author described this species on the basis of a single male individual from Chokoloskee, Monroe County, Fla.* During the summer of 1905 a number of specimens of this genus came into my hands for study, among them being six specimens which closely resembled the Florida form, the type of which was at that time not accessible. In the meantime, Mr. William T. Davis had published a record of *Conocephalus nebrascensis* Bruner, from Lakehurst, N. J., the determination having been made by Mr. Caudell,† and to fully determine the relationship of the latter species to the individuals in hand, I secured, through the kindness of Prof. Bruner, an individual of his species. This, with the type of *lyristes* now available, shows my seven specimens to be true *lyristes*, which is not closely related to *C. nebrascensis*, the latter being a species of no greater size but of a more robust build, with broader tegmina, wider and more arcuate tympanum, more expanded caudal section of the pronotum, and deeper lateral lobes of the same.

The specimens of *lyristes* mentioned above, in addition to the type, are as follows:

Ocean City, Worcester County, Md., July 21, 1905. Collected by E. Daecke. 1 ♂, 1 ♀.

Stafford's Forge, Ocean County, N. J., September 16, 1905. Collected by Morgan Hebard. 3 ♂, 1 ♀.

*Proc. Acad. Nat. Sci., Phila., 1905, p. 45, pl. 1, figs. 8 and 9.

†Canad. Entom., xxxvii, p. 289.

Measurements (in mm.) of the specimens examined are as follows:

	Length of Body.	Length of Rostrum.	Length of Pronotum.	Caudal width of Pronotum.	Length of Tegmen.	Greatest width of Tegmen.	Length of Caudal Femur.
C. nebrascensis Bruner, Moline, Ill., ♂	30.5	3.	8.2	5.5	37.2	6.7	21.
Conocephalus lyristes Rehn, Chokoloskee, Fla. (type). ♂ . .	30.5	3.1	7.6	4.9	39.2	5.	21.
Ocean City, Md., ♂	30 5	2.2*	8.1	4 8	36.2	5.4	21.5
" " " ♀	31.7	3.	7.5	4.5	43.	4.5	22.
Stafford's Forge, New Jersey, ♂	30.5	3.1	7.7	4.6	40.	5.2	20.8
Stafford's Forge, New Jersey, ♂	30.5	3.5	8.	4.8	38.2	5.5	20.8
Stafford's Forge, New Jersey, ♂	29.	3.2	8.	4.6	39.4	5.4	21.5
Stafford's Forge, New Jersey, ♀	28.2	3.4	6.7	3.8	42.	5.1	20.5

The tympanum of the type of *C. lyristes* measures 7.5 mm. long by 4.8 mm. in greatest width; in the specimen of *C. nebrascensis* it is 7 long by 5.6 in greatest width.

PLEASE read the editorial notice in this issue in regard to subscribers.

ON PRONUNCIATION OF ENTOMOLOGICAL NAMES.—1. Has any code or organization fixed the pronunciation of scientific names, e.g. the A.O.U. code, or the International Congress of Zoology?

2. How should entomological names be pronounced? By the rules of what language? Can any one reconcile the fact that English-speaking botanists use the Continental pronunciation and English-speaking entomologists use the American method or a hybrid?

3. Why do American scientists insist that the English system should be used, when they are vastly in the minority, when the world's scientists are concerned.

More in detail: a. when is the penult long, when short? b. is the antepenult always accented? c. how should the vowels be pronounced? how should ch, ae, cc, j, g; c followed by a, u, o; c followed by i, e, y be pronounced?—ANONYMOUS.

*Not complete.

Number of Eggs of Samia cecropia, Pulvinaria innumerabilis, and Culex pipiens.

JOHN J. DAVIS, Urbana, Ill.

Samia cecropia Linn.

The following table gives the number of eggs laid by individual females of *Samia cecropia*. As is shown in the table there is a wide range in the number of eggs laid by different individuals, this varying from 119 to 366, but these are apparently exceptions to the rule as most of the counts range between two and three hundred. The cecropia cocoons were kept in the laboratory for part of the winter and for this reason the dates of emergence are earlier than they would be normally.

NUMBER.	DATE WHEN FIRST FOUND MATING.	DATE WHEN EGG-LAYING BEGAN.	NUMBER OF EGGS PER FEMALE.
1	8 A. M., May 10, 1905.	Evening of May 11, 1905.	161
2	" " "	" " " "	213
3	" 12 "	" " 13, "	220
4	" " "	" " " "	238
5	" " "	" " " "	236
6	" " "	" " " "	207
7	" " "	" " " "	293
8	" " "	" " " "	267
9	" 14 "	" " 16, "	355
10	" " "	" " " "	219
11	" " "	" " " "	240
12	" 16 "	" " 17, "	284
13	" " "	" " " "	239
14	" " "	" " " "	209
15	" " "	" " " "	119
16	" " "	" " " "	238
17	10 A.M., Apr. 17, 1906.	" " Apr. 18, 1906.	298
18	A.M., " 17, "	" " " " "	366
19	10 A.M., " 14, "	" " " 16, "	200
20	" " 18, "	" " " 19, "	276
	Total		4878
	Average per female		243.9

Pulvinaria innumerabilis Rath.

In the proceedings of the Davenport Academy of Natural Sciences, Vol. II., p. 331, Mr. J. D. Putnam says, "The entire

number of eggs laid in each nest is rarely if ever less than 500, and must often exceed 2000, though as I have not attempted to count the number in the larger nests this is only an estimate." * * * "Dr. S. S. Rathvon states, in his paper in Pennsylvania Farm Journal, 1854, that he counted in one of these nests 564 living insects and over 300 eggs not hatched." Mr. S. A. Johnson, in Bulletin 116, of The Colorado Agri. Exp. Sta., says, "The number as given by the older entomologists is from one to two thousand. These figures are probably somewhat too large and more recent writers have reduced the estimate. Cotton mentions from three hundred to one thousand and Sanders says that the number may reach fifteen hundred."

The egg masses counted were from individual females and no choice was made as to the size. They were taken at random and are examples of the average-sized nests. All were collected June 19, 1906, at Lincoln Park, Chicago, Ill.

The following table shows the number of eggs per nest:

Number	1	2	3	4	5	6	7	8	9	10	Total
Number of Eggs per Nest	3863	3814	3279	3674	3024	2856	3200	3286	3345	3761	34102

Average per nest 3410.2.

Culex pipiens Linn.

The following table shows the number of eggs in single egg masses of the common house mosquito, *Culex pipiens*, the average of the ten masses being 178.4 eggs per mass.

Number	1	2	3	4	5	6	7	8	9	10	Total
Number of Eggs per Mass	162	228	257	309	120	149	121	136	143	159	1784

Average per mass 178.4.

Some New or Little-known Genera of Empididae.*

A. L. MELANDER, Pullman, Washington.

In the following pages are noted the occurrence in North America of several genera of the dipterous family Empididæ, that are not given in our publications. Their publication is given at the present time in order to explain more fully the citations that will appear in the forthcoming edition of Dr. Williston's Manual.

TACHYDROMIINÆ.

CHERSODROMIA Walker.†

This genus is known from six European species and one from Australia. We have one described species in our fauna that belongs to this genus. It is *Stilpon houghii* Melander, placed in Professor Aldrich's Catalogue of the North American Diptera in the genus *Coloboneura.*

THINODROMIA gen. nov.

Thinodromia inchoata spec. nov.

Thick-set, black, pruinose, black-bristly little species with dorsal arista and aborted wings. Eyes deeply emarginate at the antennæ, the facets uniformly large: face and front of male and female similar, of equal length and uniform breadth, gray pruinose; the hollowed vertex also gray pruinose, with three large ocelli, and strong ocellar bristles; occiput gray pruinose, the occipital bristles moderate; palpi large, flat, elongate-ovate, white pruinose, with a few black hairs, overlapping the proboscis; proboscis very stout, pointed, bent back; antennæ three-jointed, though the first joint minute, the third joint short-ovate with a long arista arising from near the middle of its dorsal side, the basal joint of the arista short, the outer long and microscopically plumose.

Thinodromia inchoata—a, antenna.

The pollen covering of the dorsum of the thorax more or less golden; mesopleura with a polished black area not pruinose; humeri not constricted; humeral and supra-alar bristles large, acrostichal and dorso-

*Contributions from the Zoological Laboratory of the State College of Washington.

†(Ins. Brit. I. xx., p. 137, 1851.)

central rows small, between the dorsocentrals and the pleura are a few irregular bristles; scutellum with two long and two outer short bristles; pleura without bristles.

Abdomen short-cylindrical, but very robust, in the male, the bristles becoming longer posteriorly, those of the seventh segment nearly as long as the last four segments; each segment with a single large lateral pit; hypopygium large, globose, closed, somewhat asymmetrical and twisted to the right, the small apical organs nearly dorsal, the hypopygium is less pruinose than the anterior portions of the body, posteriorly with long black bristles.

Legs short, robust, piceous-black, rather closely covered with short black bristles, those of under side of front femora and of outer apical side of hind femora more prominent, all the femora moderately thickened, the tarsi somewhat flattened distally.

Wings vestigeal, more or less triangular in outline, horizontally extended over the abdomen, though reaching only to the third segment, opalescent gray, a spot including the marginal cell and another around the posterior cross vein infumated; veins yellowish, costal cell and the first two basal cells distinct, marginal cell much shortened, humeral cross vein distinct, no trace of anal veins, costa bristly.

Length, 1.25 to 1.50 mm.

This species was collected in some numbers at Monterey, California, by Professor J. M. Aldrich, in May of this year. The flies were running over the hot dry sands above the sea beach in company with *Parathalassius aldrichi,* hereinafter described. Professor Aldrich states that the species could be easily caught by scooping an individual, sand and all, in one's hand. The insect would run to the edge of the hand and could be readily dropped in the collecting bottle. It is rather strange that the swarms of these two interesting species should have been overlooked by the previous collectors in that neighborhood.

Professor Mario Bezzi in his paper, "La Riduzione delle Ali nei Ditteri,"* mentions but two species of Empididæ with shortened wings. Both belong to the same sub-family as the present form. *Tachista microptera* Loew lives about stones in the inland; *Chersodromia arenaria* Haliday is from the seashore.

*Rendiconti d. R. Inst. Lomb., Vol. xxxiii, 1900.

SYMBALLOPHTHALMUS Becker.*

But one species, *S. dissimilis* Fallen from Europe, has been included in this genus. *Elaphropeza montana* Melander is a slender species much like *dissimilis* which may well be placed in the genus *Symballophthalmus*. There are also certain species described as *Platypalpus*, e. g. *canus, inops, hians,* which agree better with *Symballophthalmus* in that they lack the spur of the middle tibiæ and have the two basal cells of the wings equal.

It may be stated in this connection that *Elaphropeza* can be considered but as a subgenus of *Drapetis*. The type (*E. ephippiata*), which is the only European species, and the seven other species, all exotic, differ from *Drapetis* only in a comparative lengthening of the last antennal joint. Throughout the western United States we have a very common species of *Drapetis* (*D. unipila* Loew), which naturally shows some variation. An extreme form, which I reluctantly described as *medetera,* for I hesitated a long time before concluding it to be specifically distinct, has the third antennal joint twice the normal length. Inasmuch as there are intergrades it is unwise to give this single character generic value; *cf.* D. W. Coquillett, Proc. ent. soc. Wash., 1903, p. 265.

HYBOTINÆ.

PRORATES gen. nov.

Head globular but depressed, the face extremely short. Eyes contiguous on front in the male, the facets of the upper two-thirds enlarged: antennæ two-jointed, the first joint minute, the second compressed, conical, without a style or arista: proboscis rigid, shorter than height of head, projecting horizontally forward.

Thorax but little convex, one prealar, one supra-alar, and two scutellar, but no other bristles present: tegulæ minute, with white cilia. Legs slender, nowhere thickened, devoid of bristles, pulvilli minute. Abdomen slender; genitalia blunt, conical, not enlarging the diameter of the abdomen, entirely included within two lateral valves, no projecting parts.

*Wien. ent. Zeitg., viii, 285, 1889.

Wings broad, anal angle rectangular, auxiliary vein ending in the costa at the middle of the wing, the costa extends to the third longitudinal vein; a black elliptical stigma surrounding the tip of the first vein; joint origin of the second and third veins arising nearer the humeral than the anterior cross vein; third longitudinal vein furcate before the middle of the first posterior cell: discal cell pentagonal, emitting two posterior veins of which the anterior is furcate; none of the posterior veins attain the wing margin; all the basal cells large, the discal cell small; anal cell longer than the second basal, its outer angle acute, anal vein reaching the wing margin.

Prorates claripennis nov. spec.

Male.—Length, 3 mm.—Black over all, dorsum of thorax olivaceous, with two fuscous vittæ, pleura and occiput lightly cinereous, abdomen not dusted. Occiput and abdomen with very fine pale scattered hairs. Legs entirely black. Wings pure hyaline, the stigma and veins blackish. Halteres black.

Prorates claripennis—a, antenna.

Two males, collected by Mr. H. L. Viereck, at Highrolls, New Mexico, June 12 and 13, 1902.

OCYDROMIINÆ.

PARATHALASSIUS Mik.

The genus *Parathalassius* was erected by Professor Joseph Mik* for a small silvery-gray species collected on the sands near Venice, in May. The species was found in a search for the Dolichopodid *Epithalassius,* but it was not discovered until the collected material was worked over, owing to a remarkable resemblance between the two species. Only females of the Empidid were taken, although apparently the species was very common.

In May of this year Professor J. M. Aldrich chanced on a similar silvery-gray form sporting on the arid sands at Monterey, California. Although no specimens of the European

*Wiener Entomologische Zeitung, X Jahrg., p. 216, 1891.

species are at hand for comparison, the agreement of our form with Professor Mik's description makes us believe the two forms to be congeneric. Like so many of the other Diptera living on the sand,* *Parathalassius* is conspicuous by its dense coating of pollen. Even the hairs and bristles are glistening white, so that the males especially, when viewed from in front, are ornate with a silvery sheen.

The European species (*P. blasigii*) possesses several conspicuous white hairs on the under side of the hind femora, and these are lacking in the California form. Moreover, in *blasigii* the first posterior cell is narrowed at its apex. Otherwise, our species tallies well with Mik's description.

Parathalassius aldrichi sp. nov.

Male.—Length, 2.75 mm.—Entirely silvery-gray pruinose, all the bristles white. Vertex broad, concave, silvery pruinose: ocelli widely separated; one pair each of vertical, frontal, and ocellar bristles; face very narrow below the antennæ, concave, broadening at the convex clypeus, closely covered with short silvery-white pubescence, lower facets of eyes large, those of the lowermost third concealed by a dense covering of silvery-white scale-like hairs. Eyes not at all emarginate at antennæ. Antennæ black, three-jointed, though the first two joints are minute, third joint short-oval, pointed, with a long terminal bristle-like arista. Occiput silvery-gray pruinose, occipital bristles seriately arranged below, and forming a ciliate fringe to the eyes. Proboscis and palpi minute, blackish.

Parathalassius aldrichi and face of male.

Thorax silvery-gray pruinose, the dorsum with scattered short white hairs, and with eleven pairs of short achrosticals, six pairs of long dorsocentrals, three pairs of supra-alar and three long humeral and posthumeral bristles: scutellum with four marginal bristles, no pleural bristles.

Abdomen short, with numerous white hairs, when viewed from above or the right, with but four visible segments, the second segment longest and bearing a basal transverse row of black pores. Hypopygium very large and globular, comparativey bare though pruinose, asymmetrical,

*e. g. *Lipochaeta, Thinophila, Thereva, Stichopogon,* etc., and the Empidid genera *Schistostoma, Coloboneura, Halsanalotes,* and *Chersodromia.*

attached to the left side of the body and bent forward and to the right, thereby crowding the small fifth, sixth and seventh segments to the left of the median line.

Legs slender, white bristly, middle tibiæ with small white apical spurs, the joints of the middle tarsi with small black apical spurs, under side of front femora and sides of hind femora ciliate with longer white bristles; pulvilli broad, empodium hair-like.

Halteres white. Wings whitish, veins strong, blackish, less dark basally, base of costa with a few white bristles, third longitudinal vein simple, four posterior cells, anal cross vein perpendicular to the anal vein.

Female.—Differs from the male as follows: Facets of eyes uniform, nowhere concealed by pubescence. Abdomen with five dorsal flattened segments, its apex jet black.

Over two dozen specimens of this species were saved by its collector. The type locality is the dry sands in back of the beach at Monterey, California. It gives me much pleasure to be able to dedicate this species to my dear friend and neighbor, Professor J. M. Aldrich, who discovered this interesting fly, and to whom we are indebted for a large proportion of what we know of the species of this family.

Parathalassius candidatus sp. nov.

After the description of *Parathalassius* was sent to the ENTOMOLOGICAL NEWS, Professor Aldrich discovered among his collections another specimen of the genus, but which, on account of its larger size and more bristly appearance, is distinct from the Californian form. This individual, a female, was collected at Friday Harbor, San Juan Co., Washington, during the summer of 1905. Professor Aldrich is its discoverer also.

Female.—Length 3 mm., length of wing 3.25 mm.—This species differs from the preceding only as follows: Face slightly broader; hairs of occiput more dense. Dorsum of thorax with two narrow black vittæ, each of which is bounded by rows of bristles, so that there are four rows of dorsocentrals, with about fourteen bristles to each row. Between the acrostichal bristles and the humeri is a close aggregation of short bristles, which are represented in *P. aldrichi* by a few bristles only. Scutellum with six marginal bristles. The three black pits along the lower edge of each abdominal tergite are large and conspicuous. Ovipositor large, trough-like, exserted backwards from under the last segment. Bristles of legs stronger, not recumbent but projecting; spurs

of middle tibiæ much reduced; hind metatarsi somewhat compressed; tarsi entirely black. In *aldrichi* the base of the metatarsi is somewhat yellowish. Anal vein three times the length of the anal cross-vein, in *aldrichi* it is less than twice as long as the cross-vein.

EMPIDINÆ.

TOREUS gen. nov.

Toreus neomexicana—a, antenna.

Male.—Entirely devoid of bristles. Eyes broadly separated, the lower facets larger: basal joint of antennæ small, last joint twice as long as the basal joints together, compressed conical, rather blunt; the style one-eighth the length of the third joint. Proboscis three times the length of the head, the rigid rostrum three-fifths the length of the labella: palpi short and incumbent. The proboscis extends downward and somewhat forward, and not backward, in the dried specimen.

Thorax entirely without bristles, no metapleural setæ. Abdomen robust, cylindrical, somewhat depressed apically, consisting of but six segments, the seventh forming a horizontal inverted hood-like peduncle to the hypopygium; no pits visible on any segment: hypopygium consisting of two triangular chitinous lateral clasping valves, which enclose a pair of upright decussating flattened filaments; intromittent organ curved and pointed, projecting downward from between the bases of the lateral valves; arising from the inner base of the hypopygium are a pair of curved slender diverging filamentous appendages which project above the height of the hypopygium.

Legs not long, without bristles, but with fine hairs, without apophyses or thickenings, front metatarsi two-fifths the length of the hind ones, hind tibiæ bent outwardly at their middle, pulvilli small.

Wings rather broad, anal angle broadly rounded, costa encompassing the entire wing, anal vein not or but little continued

beyond the anal cell, auxiliary vein straight, vanishing at the middle of the wing, remaining veins attaining the wing margin, the two basal cells equal in length, the anterior branch of the third vein sinuous, rather long, the second submarginal cell but slightly longer than the first along the costa.

Type: *Empis neomexicana* Melander.

ANTHEPISCOPUS Becker.*

Becker has described two European species of *Anthepiscopus, caelebs* and *ribesii,* and there is one from New South Wales (*antipodalis* Bezzi). We have a species collected at Seattle, Washington, which agrees with the description and figure of *ribesii,* but in the absence of typical specimens for comparison I hesitate before deciding as to its specific identity.

HESPEREMPIS gen. nov.

Male.—Eyes separated, broadly above and narrowly below the antennæ, the facets uniform in size. Antennæ inserted high, the triangular front therefore short, three-jointed, the first two joints together as long as the third, the third joint conical, compressed, with a short two-jointed style. The first joint of the style is thick, the second very slender. Proboscis very short, sharp and incurved, as in *Hormopeza,* etc. Palpi broad, slightly longer than the proboscis, and recumbent upon it, the upper surface with a few fine hairs. Ocellar triangle without bristles, occiput with a few fine short hairs, face bare.

Hesperempis mabelae Mel.—a, antenna.

Thorax entirely without bristles, scutellum with six fine marginal hairs, metapleura bare. Abdomen slender, provided with few fine marginal hairs only; a transverse series of minute pits present at the base of the second abdominal segment: hypopygium terminal, flattened above, globular otherwise, not enlarged, entirely enclosed in a pair of convex lateral pieces, with no dorsal or terminal processes. Legs slender, simple, rather sparsely provided with fine pubescence, but entirely devoid of bristles; pulvilli small, empodium microscopic.

*Wien. ent. Zeitg., X., 281, 1891.

Wings long slender, anal angle obtuse, not prominent, costal vein encompassing the entire wing, auxiliary vein straight, vanishing at the middle of the wing, stigmal spot faint, elongate, third vein branched, the anterior branch long, as in *Hilara,* discal cell narrow, acuminate apically, second posterior cell narrowed at the base, the contact of the third and fourth posterior cells with the discal cell equal, anal vein shortened, anal cross vein recurved and fused with the anal vein.

This description is drawn from an enigmatical little fly described as *Rhagas mabelae.* The insect is evidently an Empidine, but can not be assigned to any genus hitherto described. Its nearest relatives are *Rhagas, Haplomera, Hilarempis* and *Hilara.*

The main characters by which these genera differ from *Hesperempis* are herewith given:

Rhagas: Eyes of male contiguous; body with macrochætæ; anal angle of wing rectangular.

Haplomera: Femora thickened; third antennal joint long and nearly cylindrical.

Hilarempis: Body and legs with macrochætæ; anterior branch of third vein short.

Hilara: Auxiliary vein short and bent forward at tip.

In the Transactions of the American Entomological Society for 1902, page 277, I associated *Empis conjuncta* Coquillett with the present species as the American species of the genus *Rhagas* Walker. Mr. Coquillett* subsequently assigned *Synamphotera* Loew, which is a genus of the sub-family Hemerodromiinæ, as a synonym of *Rhagas,* and in his table stated that *Rhagas* has the anal cross vein perpendicular to the wing axis. In this he was in error: both forms are valid genera, in no ways related, for *Rhagas* is clearly an Empidine. I have since seen *Empis conjuncta.* It and *Empis triangula* Coquillett are normal species of the genus *Iteaphila.*

Through the kindness of Dr. K. Kertèsz, of the Hungarian National Museum, I have been put in possession of both sexes of *Rhagas unica* Walker, the type species of the genus. It is quite a different form from *mabelae.* Its salient characteristics

*Proc. Ent. Soc., Wash., 1903, p. 257.

are the following: Wings broad, anal angle strongly rectangular. Eyes of male contiguous. Arista, nearly one-half the length of the third antennal joint, its basal segment much thickened and many times longer than the minute, bristle-like apical portion. Dorsum of thorax with the usual rows of small but distinct macrochætæ; those of the scutellar margin larger and six in number. Hypopygium terminal, small, but open, consisting of a pair of lateral slender curved and pointed valves, surrounding the sharp penis, and a basal dorsal pair of erect prongs, like those of *Iteaphila,* etc.

A new variety of Papilio rutulus Boisd.

By Henry Skinner.

Papilio rutulus arcticus.

Smaller than *rutulus*, expanding from the centre of the thorax to the tip of the primary wing 43 mm. Orange spot at angle of secondaries large and distinct, generally absent in *rutulus.* Marginal lunules of secondaries wider and not so elongate as in *rutulus.* Blue bands of secondaries below narrower and more distinct. Marginal lunules of secondaries below orange, an orange wash running to the cell.

Described from six males and one female. Five males and one female from Eagle City, Alaska, June 1st to 15th. One male from Athabasca River, Canada.

A New Syntomeida.

By Henry Skinner.

S. befana n. sp.

Antennæ blue-black, outer third edged with white. Head and thorax blue-black; vertex of head with metallic-blue patch; tegulæ and patagia orange-yellow, edged with black; fore coxæ orange; legs blue-black, with tarsi streaked with white; abdomen black and metallic-blue; oval, orange subdorsal patches on the second to the last segment, those on first segment being quadrate; on abdomen below are orange bands on segments three to six. Forewing with an orange patch in and below middle of cell and a patch beyond the cell. Hindwing with a basal orange patch and a round patch in centre of wing.

From one specimen taken by Prof. F. H. Snow in the Baboquivari Mountains, Arizona. The species is related to *joda* Druce.

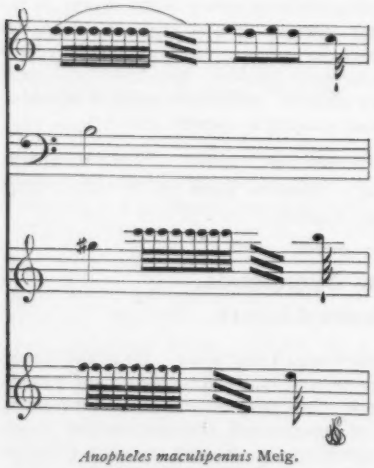
The Song of the Mosquito.

By Samuel E. Weber.

When we know the voice and song of the birds we are enabled to distinguish the particular species whose song we may hear without seeing it. Likewise in entomology, insects need not be seen to know their species if one knows their voice and song.

Most species which we have studied may be known psychologically by their song, their movements and physical expression. Insect sound is in large measure as true to structure as is physical expression in various other forms of animal life.

As an example in physical expression and structure, take the larva of the *Anopheles* mosquito which has been designated as "a lazy larva." Some of their slow movements on the surface of the water are apparently caused by the arrangement of the mechanical structure which retains them there. When the larva turns its head to the caudal extremity to remove foreign particles which have collected about the air-tube, it does the act as gingerly as though it were afraid its body might break in twain. The reason for the slow turning is explained by its attachment to the waterfilm through the means of fan-like bodies on the dorsum of the abdomen. These organs after piercing the waterfilm open out forming a palmate clinch by means of which the larva is retained at the surface. The slow movement is necessary so it



Anopheles maculipennis Meig.
Anopheles punctipennis Say.
Culex canadensis Theob.
Culex pipiens Linn.

may retain its hold in the act of arranging the toilet at its caudal end. If the turning or any other larval movements are made too quickly the hold is lost and the larva will sink.

By the expression of sound, studied at the keyboard, I have determined, without seeing them, some of the more important species of mosquitoes by their song or note. These observations were made in the eastern section of Pennsylvania.

The note of *Anopheles maculipennis* (Meig.) is D, virtually the first degree to the right of middle C, on the keyboard, which is one octave lower than the notes on Staff No. 1. When confined in a bottle and darting against the glass it will sing a note higher, and when alighting on the glass to rest, it will do so, at a staccato stop at one degree below. It seems to produce the same song in distress as in pleasure, for the same may be heard in confinement, as that when about to fathom one's blood. The ordinary hum of this species may be expressed by the thirty-second notes on Staff 1. The second part of the song may be termed as one of condition (in distinction from the love songs of insects), since the eight note at E, is sung only when darting against any object such as the glass mentioned or a person's neck or face. The part indicated by the eight notes may be continued much longer than the time here represented, and the finale or sudden stop when alighting is expressed by the staccato thirty-second note at the end of Staff 1.

The note of *Anopheles punctipennis* (Say) is B, virtually the first to the left of middle C, on the keyboard, as indicated by Staff 2, written in the F clef.

Staff 3 in the treble clef indicates the note of *Culicada* (*Culex*) *canadensis* (Theo.). The smaller variety, the most common, sing high C. Some of the larger forms of this species sing from F to F sharp and to G sharp. When the range of the note, in the same species, varies as is shown on this staff, then intonation or the peculiarity of voice plays the part of differentiation. This must be admitted, however, as a high state of the perceptive powers of man, which is possessed by very few persons. In the range of sound produced by the various species from the giant culicid *Fsorophora ciliata*

to the smaller species approaching high C we have some species which come close to one another in their note when heard flying close to the ear. *C. canadensis* and *C. sollicitans* in some instances come closely, but the latter may be easily distinguished by its peculiar beautiful quality of tone.

Culex pipiens (Linn.) (No. 4) sings in F, as a rule, but some specimens may vary a note higher or lower and may then be distinguished by the same method mentioned. While these observations may not be of any practical value they are nevertheless of interest in a certain direction. The trained ear at least may distinguish the more dangerous species of mosquitoes from the harmless by their notes.

The Method of Feeding in Leptoglossus.

By A. Arsene Girault.

The following observations on the feeding-habit of *Leptoglossus phyllopus* Linnæus appear to be worthy of publication:

On the morning of July 19th, 1906, at Myrtle, Ga., while examining some clusters of Niagara grapes, attention was attracted to an adult male of this species, clinging to some of the nearly ripe fruit. It had apparently just finished feeding, but closer notice showed that it was just on the point of making a puncture. The insect was clinging head toward the ground, and for ten or fifteen seconds examined the surface of the fruit with the tip of the rostrum, with rapid, nervous movements. Locating a suitable spot, the movements of the rostrum stopped, and it was then applied and straightened, necessarily causing an upward inclination of the body. Pressure was then brought to bear, and the rostrum was pushed into the fruit for a distance of about one-half the length of the distal joint of the labium. When about this far in, the labium commenced to bend caudad at the first articulation, exposing basal portions of the inclosed setæ, the mandibles and maxillæ. Pressure was continued, and the body was gradually brought backward and downward, causing the bending of the labium to increase, until its basal joint became applied to the ventum of

thorax, followed by the second joint, which was applied to the first. The labium was then released from the puncture, by further backward movements of the body, straightened, and borne in its natural position along the venter. This left the long, slender mandibles about one-third their length within the fruit. Pressure was again brought to bear as at first, and the ever-bending setæ were pushed in quite rapidly for over half their length, when they suddenly stopped, as if by some obstruction, were partly redrawn, and again inserted for the same distance. This was repeated several times before a cause for such actions presented itself. After the fifth attempt to push the mandibles within for most of their length, it was noticed that the much shorter maxillæ, closely applied to the mandibles so as to be inconspicuous, struck the surface of the fruit, whenever the setæ were inserted for more than half their length, and stopped further insertion. Each time that the progress of insertion was thus stopped the mandibles were slightly, redrawn, or sometimes nearly entirely so, and then reinserted until again stopped by the catching of the maxillæ. These movements were repeated twelve or more times, and then the attempt abandoned. Upon withdrawing the mandibles, the labium was raised and the setæ replaced within it by means of the aid of one or both of the fore tarsi.

These actions in feeding were repeated three times in succession on the same fruit. At the end of the second attempt the wound made by the setæ exuded a drop of clear fluid, and through this the insect attempted to reinsert the rostrum into that same wound; the fluid, however, interfered to such an extent as to cause an abandonment of the attempt.

This method of feeding, having the setæ entirely free, is different from any hitherto observed by the writer in the Heteroptera. To what extent feeding is interrupted by the apparent frequent inability to insert the maxillæ is not known.

The feeding-habit described in foregoing is also present in *Anasa tristis* DeGeer, as found by observations made on the nymphs feeding on grass in a squash patch. The method of insertion is almost identically the same, though the movements are much quicker.

New North American Heteroptera.

By E. P. Van Duzee, Buffalo, N. Y.

The species described below have come into my hands for study from collectors in various parts of the country during the past five years. It is often annoying and undesirable to have species sent out under MS. names, especially if the publication of the descriptions is long delayed, and this is my excuse for the perpetration of a fragmentary paper such as this. All of these are interesting additions to our fauna, and in each case were received from well known and experienced students of our insects.

Narnia snowi n. sp.

Broader and less narrowed posteriorly than *femorata* and its allies. Pale ferruginous testaceous; head, front of the prothorax, deflected base of the pronotum, scutellum, elytra, pectus, meso- and metapleura and the dilatation of the posterior tibiæ black or dark fuscous. Head with the apex and a longitudinal line each side both above and below the base of the antennæ ferruginous. Prothorax and pale hind margin of the metapleura coarsely, the scutellum and hemelytra finely and closely punctured; extreme tip of the scutellum and costa of the elytra ferruginous, the middle of the corium with a transverse linear white band, not attaining the costal margin. Hind femora becoming piceous toward the apex, the spines and tubercules black; dilatation of the hind tibiæ rather broad, inner margin about twice the width of the outer and marked with a white sub-basal spot, the edge beyond the middle and along the undilated apical one-third sparsely spinose. Venter more or less mottled and infuscated, with a strong sulcus reaching the apex of the 5th segment. Rostrum passing the middle of the fourth ventral segment, blackish, with the basal joint pale. Antennæ substantially as in *femorata*. Length 16 mm.

Described from one female specimen received from Prof. F. H. Snow and captured by him at Douglas, Arizona, in August.

I have before me three male and two female examples of a *Narnia* that I take to be *femorata*. In these, however, the basal joint of the antennæ is scarcely darker than the others, the humeral angles are not "acute" although more prominent than in the allied forms, and the transverse white vitta on the corium is indicated only by an obscure band of white hairs that may be almost obsolete in some examples; the form of the dilatation of the hind tibiæ is, however, exactly as described by

Stal, and for the present I prefer to place it as the northern form of his species. Two of my specimens were taken at Tucson, Arizona, by Prof. E. B. Wilson, two were captured in Yuma Co., Arizona, by Prof. Snow in June, and one was taken at Congress Junction, Arizona, in July by Prof. Snow. Prof. Wilson has also sent me two examples of a smaller paler species from La Jolla, California, that I place as Stal's *pallidicornis*. They answer to his description in everything except that the head is almost entirely black and the rostrum is longer, attaining the apex of the fifth segment. This species has the apical notch of the male genital segment deeper and narrower than in *femorata*.

Narnia wilsoni n. sp.

Deep piceous black; lower surface of the head, antennæ, base of the rostrum, bucculæ and legs bright ferruginous; abdomen testaceous; extreme tip of the scutellum and a transverse linear band on the middle of the corium, not attaining the costa, white. Antennæ shorter and thicker than in any of our other described species, the basal joint scarcely surpassing the apex of the head. Pronotum and scutellum closely punctate. Elytra deep velvety black, with the costa slenderly pale; membrane fuscous black, the nervures undulating and here and there anastomosing. Hind legs piceous-black, becoming ferruginous on the base and outer side of the femora and knees; simple apex of the tibiæ and the tarsi bright ferruginous, tibial dilatation about as in *snowi*, almost linear without, within about twice wider, with a few strong teeth from near the base to the apex of the tibia, and showing no indication of the white mark found in our other species. Rostrum short, scarcely surpassing the base of the fourth ventral segment. Venter covered with a white mealy pubescence which omits the rather broad median sulcus. Length 12 mm.

Described from two female examples taken at La Jolla, California, in August, by Prof. E. B. Wilson.

This is a very distinct and striking species. With *snowi* it forms a group for which I would suggest the subgeneric name of *Xerocoris*, which with the study of more extensive material may be raised to generic value. It may be characterized by a broader form, wider connexivum, more strongly depressed posterior margin of the pronotum, a proportionately shorter head, shorter and stouter antennæ, a shorter rostrum and a different vestiture. In both these species the disk of the pronotum is flatter with a distinct median carina which is scarcely indicated

in *Narnia* proper, and the lateral margins are much more distinctly carinated, the surface of the body, also, is not covered with a close grayish mottled pubescence, as in *femorata* and *pallidicornis*, but the head, pronotum, antennæ and legs are well covered with stiff blackish hairs that become concolorous on the pale disk of the pronotum in *snowi*.

The shorter basal and fourth joints of the antennæ and the less dilated hind tibiæ seem to be the best characters for separating *Narnia* from *Leptoglossus*. The length of the rostrum is variable, and while distinctly longer in *Narnia* proper, in *Xerocoris* it is scarcely longer than in *Leptoglossus*. In *Narnia* proper the vestiture is quite distinct.

Alydus setosus n. sp.

Allied to *eurinus* in form but pale greyish, marked with fuscous somewhat as in *Stachyocnemis apicalis*. Whole body except the elytra clothed with scattering black setæ and in places with a matted greyish pubescence. Postocular portion of the head longer and more narrowed posteriorly and the vertex more convex than in *eurinus*. Apical joint of the antennæ strongly thickened hardly as long as the two preceding united. Pronotum a little narrower anteriorly than in *eurinus*, the latero-posterior margins broadly depressed and a little reflexed. Rostrum attaining the intermediate coxæ. Posterior femora longer and stouter than in *eurinus* with from three to five long teeth and several smaller ones near the apex. Posterior coxæ placed farther apart than in *eurinus*. Claspers of the male approximate, thick, spindle-shaped, their divergent apices somewhat flattened and obtusely pointed.

Color testaceous grey. Head paler beneath; the gula, a broad vitta on each side beneath the antennæ, and a still broader dorsal vitta blackish, the latter narrowed and intensified on the base of the head and bisected by a median longitudinal pale line. Antennæ pale brownish, apical joint a little darker, the outside of the basal joint with a dark line; all but the apical joint black-setose. Pronotum with a broad blackish median ray which becomes evanescent posteriorly and is bisected by a conspicuous whitish median line; pale areas with scattering fuscous punctures. In some examples there is a faint blackish submarginal ray anteriorly. Scutellum a little dusky on the sides and base and with a pale median line continuing the white calloused and slender apex. Elytra punctured with pale brown, especially toward their inner margin and apex, their extreme tip and the inner field blackish; nervures pale; apical margin narrowly white and calloused. Membrane brownish pellucid with the nervures but little branched. Beneath paler, sternum and a double lateral vitta on the pleural pieces fuscous, venter dusky on the base and sides, separated by a lateral pale vitta, edge of the connexivum and pos-

terior margin of the ventral segments more or less broadly pale ; stigmata, disk of the genital pieces of the female, and the latero-apical margin of the pygofers of the male black. Claspers of the male whitish. Legs dotted and more or less clouded on the femora with fuscous, clothed with stiff black hairs ; femoral spines black.

Described from four examples taken by Prof. F. H. Snow on the Baboquivari Mountains, Arizona, one male taken in Gallatin Co., Montana, at an elevation of 7500 feet, by M. R. Benton and kindly sent to me by Prof. R. A. Cooley, and one female taken in Big Canon, Davis Co., Utah, in August by Mr. G. W. Browning. The two latter specimens are darker in their general color with the elytra quite uniformly punctured with fuscous and the pale rays on the base of the vertex and anterior margin of the pronotum tinged with pink. All these specimens show a row of black or piceous polished spots on either side of the venter beneath the stigmata. This strongly marked species exhibits a certain transition toward genus *Stachyocnemis*. It has the color markings of the latter genus and the form and proportions of the former, but the form of the apical joint of the antennæ and the spacing of the posterior coxæ approach that found in *Stachyocnemis*. The thick approximate claspers of the male will distinguish this form from any previously-described North American species.

Jalysus wickhami n. sp.

Closely allied to *spinosus* Say, but smaller and more slender with the second joint of the antennæ and the basal joint of the rostrum proportionately shorter. Color fulvo-testaceous, paler on the elytra, base of the legs and pronotal carinæ. Eyes, fourth antennal joint, extreme tip of the corium, apex of the tibiæ, the tarsi except at base and the rostrum toward its apex, black ; venter rufo-testaceous, sternum obscured or brownish. Metapleural and scutellar spines distinctly shorter than in *spinosus ;* posterior lobe of the pronotum strongly punctured, the sides and middle line distinctly carinate, the lateral carinæ continued almost to the humeral angles, not strongly abbreviated as is usually the case in *spinosus ;* apex ot the fourth antennal joint white. Length 6-6½ mm.

Described from two males taken by Prof. H. F. Wickham at an altitude of over 7000 feet on the Inyo Mountains, California, in July, and one female taken at Tucson, Arizona, by Prof. F. H. Snow.

This species might readily be mistaken for our common

spinosus. It may most readily be distinguished by its slighter form, shorter second antennal joint, the more distinct lateral carinæ of the pronotum and the less conspicuous metapleural spines. In this species there is an obvious elongated callous above the eyes and anterior to the ocelli, which is much less conspicuous in *spinosus*.

Peritrechus tristis n. sp.

Form of *fraternus* but smaller, black, opaque, scarcely covered with minute golden pubescence which is much longer and closer on the venter. Vertex, pronotum and scutellum coarsely punctate. Pronotum a little wider before than in *fraternus*, the sides more nearly parallel; posterior lobe but very feebly depressed and more closely punctured than the anterior, very obscurely touched with castaneous, particularly near the hind edge. Scutellum obscurely bordered with castaneous posteriorly. Elytra testaceous brown or blackish, the nervures pale. There is a smooth whitish spot near the inner angle and about three irregular ones in a longitudinal row exterior to this. Membrane blackish, nervures and a spot at base, more or less distinct, pale. Beneath black touched with testaceous next the coxæ. Throat and pleural pieces opaque, coarsely punctate; hind edge of the metapleura and the venter impunctate, the latter polished and golden pubescent. Legs piceous black, polished, paler on the tibiæ and tarsi; knees and base of the femora testaceous. Antennæ fuscous, hairy; basal joint a little exceeding the apex of the head, second longest, third shorter than the fourth but considerably longer than the first. Rostrum reaching to the intermediate coxæ, piceous, paler on the second joint and tip of the first.

Described from six specimens collected about Victoria and Wellington, Vancouver Island, by Rev. Geo. W. Taylor during March, April and October. This is a smaller and darker species than our eastern *fraternus*, the elytra are darker and more mottled, and the posterior lobe of the pronotum is not pale as in that species. The European *Stygnus arenarius* bears a close resemblance to the present species but is only about one half its size.

Eremocoris obscurus n. sp.

Allied to *ferus* but darker in color with the pronotum a little wider posteriorly and the abdomen proportionately broader behind the middle. Color black, opaque, head finely chagrined, tip of the tylus tinged with castaneous. Antennæ piceous black, the incisures pale, basal joint shortest, second a little longer than either of the others which are subequal. Rostrum testaceous, basal joint piceous reaching almost to the

base of the head, second longest reaching the anterior coxæ, third attaining the intermediate coxæ. Pronotum, anterior lobe a little more convex than in *ferus*, feebly impressed on the middle with a few minute scattering punctures; posterior lobe narrow, coarsely punctured, but feebly differentiated from the anterior lobe. Scutellum coarsely punctured, depressed anteriorly and posteriorly with a feeble longitudinal carina. Elytra blackish fuscous inclined to castaneous on the clavus and disk of the corium posteriorly; basal third of the corium testaceous; this pale color shows a tendency to invade the outer margin of the clavus and extends more or less obviously along the costa. Membrane black, when fully developed attaining the tip of the abdomen, and marked with a small pale spot at the basal and each lateral angle, the nervures distinct but scarcely paler as in *ferus*. Beneath black marked with castaneous against the coxæ. Legs piceous black, polished, becoming paler on the tibiæ, tarsi and base of the femora; the anterior femora have two large and several minute teeth beneath; intermediate and posterior femora a little more thickened than in *ferus*. In the male the colors are somewhat paler than in the female. Length 6-6½ mm.

Described from one male and two female examples taken at Wellington, Vancouver Island, during March and April by Rev. Geo. W. Taylor, an enthusiastic and successful collector from whom I have received some interesting Hemiptera. In this species the pronotum is wider on the anterior lobe than in *ferus*, the abdomen is proportionately broader behind the middle, the intermediate and posterior femora are thicker, and in the specimens before me the body wants the ciliæ of soft hairs that are present in that species.

Xestocoris n. gen.

Ovate oblong, widest across the apex of the clavus; polished. Head about two-thirds the length of the pronotum, subcylindric, horizontal, triangularly narrowed before; clypeus prominent; bucculæ but little elevated, forming a distinct lobe either side of the base of the rostrum. Ocelli placed much nearer to the eyes than to the middle line of the vertex. Rostrum passing the intermediate coxæ, first joint reaching the base of the head, second distinctly longer than the third, fourth shortest. Antennæ stout, first joint surpassing the apex of the head by about one-half its length, second and fourth subequal, third shortest. Pronotum broad, length to humeral width as about 5:8, sides feebly carinate, distinctly rounded to the head anteriorly, transverse impression feeble, placed close to the posterior margin, the humeri prominent and angular. Scutellum depressed, to the level of the clavus. Clavus triseriate punctate. Third ventral suture strongly curved forward. Stigmata of the apical segments minute, placed at about their middle. Sides of the fourth

ventral segment with three small opaque spots two of which are approximate and placed anteriorly. Anterior femora incrassated, armed with about four minute teeth one of which is longer and stouter.

In Stal's synopsis of the extra-European genera of the *Lethæria*, to which subfamily this genus pertains, it would run nearest to section "14 (11)" but it is quite distinct from the African genus *Androgæus* there defined. I can find no European genus in which it can be placed.

Xestocoris nitens n. sp.

Piceous black, highly polished; above long setose; basal two joints of the antennæ, rostrum, clypeus, anterior and posterior margins and very slender lateral carinæ of the pronotum, clavus, corium, legs, and apex of the abdomen, testaceous or rufo-testaceous; coxæ and narrow margins of the pleural pieces more or less rufous. Humeri prominent, rectangular, pale. Head and anterior lobe of the pronotum impunctate, the narrow hind margin of the pronotum, the scutellum, and the elytra with coarse scattering punctures which form a single line on either margin of the scutellum, three on the clavus, and about three imperfect rows on the disk of the corium and one on the inner edge of the broad costal area. Membrane short, the nervures nearly obsolete. Venter piceous or black. Eyes rufous. In the specimens before me there are a few coarse punctures close to the anterior margin of the pronotum and a little group near the centre of its disk, and in some the disk of the corium is embrowned. By oblique light and under a lense the dark surfaces exhibit very beautiful metallic blue reflections. Length 3-3½ mm.

Described from nine examples representing both sexes. Eight of these were taken by me at Colden, near Buffalo, New York, in August; the other specimen was taken by Mr. Philip Fischer at Buffalo in March.

Reduvius (Opsicœtus) senilis n. sp.

Much smaller and paler in color than *personatus*. Pale testaceous brown inclining to piceous on the head, pronotum and scutellum; hemelytra clouded with brown with an indefinite spot behind the scutellum, the base of the costa and the apex of the corium whitish; whole surface covered with rather long hairs. Head more tumid behind the eyes, a little narrower and more deflexed before the eyes than in *personatus;* eyes and vertex about the ocelli black; anterior lobe of the pronotum strongly convex and polished, with a deep median sulcus; posterior lobe rather strongly rastrate-punctate, the collar of the anterior lobe shorter than in *personatus*. Scutellum shorter with the apical spine less developed than in the allied species. Beneath paler with the sides and apex of the venter in some individuals suffused with blackish; the metapleura and venter

sharply keeled through their whole length, the extreme edge of this keel piceous. Length 10 mm.

Described from three specimens taken by Prof. F. H. Snow in the Baboquivari Mountains, Arizona.

Reduvius personatus, the so-called "kissing-bug," is the only species of this large genus heretofore recorded from America. Most of the known species have their home in the palæarctic region but a few are found in the tropical portions of Asia and Africa. The species here described is but one of the interesting Hemiptera discovered by Prof. Snow in his entomological explorations in the far southwest.

A New Cuterebra from Nebraska.

By PAUL R. JONES, Lincoln, Neb.

While on a collecting expedition near Glen, Sioux County, Nebraska, during the summer of 1906, two specimens of *Cuterebra* were captured by Mr. Harry S. Smith. In determining them one was found to be C. *tenebrosa* Coquillett, and the other appeared to be new, the description of which is submitted below.

Cuterebra cyanella n. sp. ♀. Head black, front at narrowest point seven times as wide as the distance between the two posterior ocelli. Front on each side provided with two small, yellowish-gray triangular spots, one on the inner margin of the eye, and the other between it and the base of the antennæ. In addition to these there is another pollinose spot of similar size on the eye-margin of the face just below the lateral one of the front. Face black, sub-shining, destitute of pollen except for the spot mentioned, and a faint crescent-shaped mark on the lateral edges of the antennary pit. Antennary pit black, shining, pollinose behind the antenna. Antennæ black, third joint pollinose. Arista longer than the antennæ, loosely plumose, black at the base, yellow at apex. Thorax black, with a slight bluish cast, sub-shining, covered with fine black hairs, pleura with longer hair of similar color, and destitute of any oblique tuft of yellow pile in front of the base of the wings. Scutellum of same color, but the hair longer than that of the thorax. Abdomen shining steel-blue, anterior lateral margin of third, fourth and fifth segments pollinose be-

coming greater in width until the whole venter is pollinose. Band of the third overlaps the posterior margin of the second segment underneath. Legs black, on the outer part of the basal half of the hind femora, and of all the tibiæ gray pollinose. Hair everywhere black. Halteres and calypteres dark brown, wings light brown, veins at base tinged with yellow. Length of the body 17.5 mm. Length of wings 14.5 mm. Width of head 7 mm. Width of front at vertex 2⅔ mm.

This species belongs to the *fontinella* group, and is closely allied to *C. similis* Johnson, *C. atrox* Clark, and *C. tenebrosa* Coquillett. It differs from *C. similis* Johnson, and *C. atrox* Clark in not having the oblique tuft of yellow pile in front of the wings, and the face is without the two large pollinose spots at the lower margin of the eye. It can be separated from *C. tenebrosa* Coquillett by the pollinosity of the abdomen, and the fissure on each side of the antennary pit being narrower and more shallow than in *C. tenebrosa*.

Mr. Swenk's table of the genus *Cuterebra*, which appeared in The Journal of the New York Entomological Society, pages 181–185, December, 1905, may be amended to read as follows:

5. Pleura mostly yellow or white . . . . . 6.
5. Pleura wholly black or at most with a small tuft of yellow pile in front of the base of wing . . . . . 15.

* * * * * * * * * * * * * *

15. Pleura with a tuft of yellow pile in front of the base of wings; lower margin of the eye with two large pollinose spots . . . . . 16.
15. Pleura without such tuft of pile, lower margin of eye without the large pollinose spots . . . . . 17.
16. Last abdominal segment more or less pollinose (Mexico). (**terrisona** Walker) **atrox** Clark.
16. Last abdominal segment entirely steel blue, not pollinose (N. M.). **similis** Johnson
17. Abdomen destitute of pollen (Cal., Ore., Col., Wyo., S. D., Nebr.). **tenebrosa** Coq.
17. Abdominal segments ⅔ pollinose ventrally and laterally (Northwest Nebr.) . . . . . **cyanella** Jones.

A CORRECTION.—Dr. Dyar has kindly called my attention to the fact that the insect I described in the October NEWS as *Monoleuca spadicis* is the same as his *Euclea dolliana* (Proc. U. S. Nat. Mus., xxix, 369, 1906).—JOHN A. GROSSBECK.

A new Platycerus, and a new Pleocoma.

By H. C. Fall, Pasadena, Cal.

The following fine species of *Platycerus* and *Pleocoma* are somewhat recent discoveries of Mr. Ralph Hopping, of Kaweah, California. They are quite distinct from all previously-described forms as will be seen from the following descriptions and comparisons:

Platycerus opacus n. sp.

Male.—Moderately convex, black, entire surface finely alutaceous and dull, the head and prothorax a little less so than the elytra. Scape of antennæ very nearly twice as long as the funicle, the latter ⅔ as long as the club; first funicular joint as long as the next two, sixth slightly acutely produced inward; first two joints of club subequal and about twice as wide as long, last joint nearly as long as wide. Mandibles small. Head coarsely densely punctured and sparsely hairy. Prothorax ½ wider than long, widest at or just before the basal third, where it is strongly rounded but not angulate; sides feebly arcuate and strongly convergent anteriorly, still more rapidly converging to the deep sinuation before the basal angles, which are sharply defined, a little acute and everted; surface densely but not coarsely punctate laterally, less densely but still closely and a little irregularly toward the middle, a narrow median incomplete impunctate line; lateral margin flattened at the point of greatest width, narrowing before and behind. Elytra very little wider than, and not quite twice as long as the prothorax, 1⅔ times as long as wide, subparallel, striæ represented by unimpressed series of very fine punctures, which are scarcely distinguishable from those of the intervals and are in great part confused with them. Legs rather slender, the hind tarsi about ⅔ as long as the tibiæ.

Female.—Large and more convex than the male, the elytra a little more arcuate at sides; antennal funicle very slightly shorter than the club, the first two joints of the latter more strongly transverse; hind tarsi ½ the length of the tibiæ.

Length ♂, 8.5-10 mm.; ♀, 10.5-12.5 mm. Width ♂, 3.5-4.1 mm.; ♀, 4 8-5.5 mm.

Described from a series of 4 ♂'s and 3 ♀'s taken by Mr. Hopping at Clear Creek (June 5–12) and South Fork of Kaweah River (Jan. 28–30), California. "Both these localities"—writes Mr. Hopping—"are in the Sequoia National Park, and the beetles occur in the Black Oak or Upper Chaparral belt, at an elevation of 4000 to 5000 feet, and so far have only been found by digging, or where earth was being removed from the upper roadbank."

Opacus is to be associated with *thoracicus* Csy. and *latus* Fall, by its form and tarsal structure, but is very different from either in its subopaque surface and fine sculpture.

Pleocoma hoppingi n. sp.

Male.—Oblong oval, sides of elytra nearly parallel, color above and beneath bright reddish brown, shining, head prothorax and underbody densely clothed with long fulvous hair. Antennæ very nearly as in *hirticollis*, clypeal horn deeply triangularly notched, lateral ante-ocular processes subquadrate, their outer edge parallel with the axis of the body (triangular in *hirticollis*, the external edge strongly oblique); vertical horn emarginate at tip. Prothorax not quite twice as wide as long, hind angles obtuse but fairly distinct, sides before them very slightly convergent and just perceptibly sinuate, then rounded and strongly convergent to apex; basal margin evenly arcuate from side to side; disk evenly convex, only slightly flattened anteriorly, surface rather densely coarsely punctate at the middle in front, less densely and somewhat more finely at sides and posteriorly, a small subimpunctate area each side of the middle of the disk. Elytra barely ⅓ as wide as long, sutural stria deep, geminate striæ feeble, punctuation fine and sparse, sides almost smooth. The female differs as usual in its larger size and stouter form which is wider behind; the prothorax is glabrous and nearly uniformly punctate throughout; the elytra are more closely and strongly punctate than in the male, being virtually as closely and strongly so as the prothorax; the clypeal notch is small, the sides obtusely rounded; the ante-ocular processes formed as in the male.

Length ♂, 23-26 mm.; ♀, 30 mm. Width ♂, 13-14 mm.; ♀ 20 mm.

Described from a series taken by Mr. Ralph Hopping on the South Fork of the Kaweah River, Cal., and bearing dates Jan. 25 and Feb. 4.

Because of its octo-lamellate antennæ, and closely punctate and hairy prothorax, this species is comparable only with *hirticollis*. The latter, as we understand, is a distinctly smaller and stouter species, the male always black or nearly so when mature, the hair of a paler yellow, prothorax declivous and plainly flattened in front, the posterior margin bisinuate, the elytra more strongly punctured. There are some discrepancies between the original description of Schaufuss and the later ones of LeConte and Horn, and there is therefore a possibility that our interpretation of *hirticollis* is erroneous. In Schaufuss's description the prothorax is said to be almost three times as wide as long, while Horn says "more than twice as

wide as long." As a matter of fact the width is barely twice the length in both *hirticollis* and *hoppingi*, and it is probable that both authors have given the relative dimensions from a vertical view point, in which case there would be considerable fore-shortening. I take pleasure in dedicating this fine species to friend Hopping, whose explorations in the Californian Sierras have brought to light not a few new and interesting species.

Notes on Moths.

By Caroline Gray Soule.

At one time there was some discussion of the cause of difference in the forms of cocoons of *Attacus cecropia*, and some very positive statement that the baggy cocoon was always found low on the shrub or tree and in damp lowland places.

Last September I found three huge *cecropia* larvæ feeding on red-berried elder by the roadside, in a dry, sunny place. They were so large that I took them, put them in a large box with twigs fastened vertically and horizontally, and the larvæ spun the next day.

One made a normal, slender cocoon on a horizontal twig: another made a very baggy cocoon on a vertical twig; the third made a rather baggy one, of a green color except on one side where the normal brown predominated. This cocoon was on a horizontal twig, and against the side of the box.

On June 9th were laid eggs of *Hemileuca budleyi* from moths descended from two pairs of moths received in 1903.

Their egg-period was 36 days; 1st stage, 7 days; 2d stage, 5 days; 3rd stage, 8 days; 4th stage, 7 days; 5th stage, 10 days; 6th stage, 10 days; 7th stage, 16 days, making 63 days from egg to cocoon, and a sixth moult, which had not occurred in any former brood. Although "bred in" for three generations they were very large, fine specimens, but very slow in all their stages. One correspondent, to whom I had sent eggs, wrote that his brood left the wild cherry tree on which he had placed them, and marched eight or ten feet to a small apple tree where he found them feeding and thriving.

larvæ crawling, for pupation, on a wooded road. Of the fifty-one which I took and which pupated, thirteen gave the moths on August 22d-25th. These moths mated and their eggs hatched in due time. The other pupæ are alive and in good condition, but seem to be waiting for another summer before giving the moths, a new experience to me.

NAMES OF COLEOPTERA.—In the NEWS of last September I cited *Aphanotus* Lec. as a homonym of *Aphanotus* Lowe, but did not propose a substitute. I am indebted to Dr. D. S. Jordan for the information that Lowe's genus was really *Aphanopus*, and "*Aphanotus*," as given in the Nomenclator Zoologicus, is a mistake.—T. D. A. COCKERELL.

REMEDY FOR MOSQUITOES.—A Memphis (Mo.) man has discovered a new way to get rid of mosquitoes. He says to rub alum on your face and hands. When the mosquito takes a bite it puckers his buzzer so it can't sting. It sits down in a damp place, tries to dig the pucker loose, catches its death of cold, and dies of pneumonia.—*Newspaper.*

TWENTY-ONE MILLION BUTTERFLIES CAUGHT.—Belgrade, Sept. 8.—Owing to the damage done to crops by butterflies, the Servian Minister of the Interior offered four cents for every 500 captured. Although the amount appears small, the pursuit of butterflies is profitable, as already 21,000,000 of them have been tendered for reward. The minister says it is cheap to get rid of these millions at a cost of $4,250.—*Newspaper.*

CERCERIS DESERTA Say.—New Haven, ♀, June 27, 1902 (E. J. S. Moore); ♂, August 16, 1904 (O. H. Walden). Only the ♂ has heretofore been known to science. The ♀ here cited differs from the ♂ of the same place as follows: clypeus produced, the production a little wider than long, nearly quadrate, planate, projecting downward and outward and forming with the face an angle of about 45°, the anterior margin of the projection slightly broadly produced in the middle, clypeal projection with a broad transverse yellow band leaving an anterior and posterior band of black about half as broad as the yellow lateral face marks, nearly an obtuse angled triangle adjoining the eyes, with a rather broad black space between them and the yellow clypeal mark and a narrower black space between them and the insertion of the antennæ; greater part of first dorsal abdominal segment covered with almost semicircular yellow marks that almost attain the posterior margin of the segment along their diameter and that are separated from each other along the middle line by a dark line narrower than the width of the pedicellum; dorsal abdominal bands broader, venter entirely black; coxæ and trochanters almost entirely black, anterior and middle femora black, tipped with yellowish brown, posterior femora pale and dark brown, posterior tibiæ yellow, with the apical third of the posterior aspect brown.—H. L. VIERECK.

Two ♀ *Samia cynthia* moths mated with ♂ *A. promethea*, and both sets of eggs hatched. The larvæ throve on wild cherry, preferring it to any of the leaves which *cynthia* prefers to cherry—in my experience—yet there was no trace of *promethea* in their appearance. Their cocoons are more like those of *promethea*, being smaller, browner, and more slender in shape than the usual *cynthia* cocoon.

When a cocoon was nearly finished the larva would crawl to the upper end, seize a bunch of the loose threads, at the open end, in its mandibles, and, letting go all hold with legs and props, "pounce down" violently, pulling the bunch of threads in and down. Then the larva let go the threads, which remained drawn toward the back, or "stem"-side, of the cocoon, crawled up to the top and repeated the process until all the loose threads had been gathered close to the back of the cocoon, and its mouth was closed. I have never seen any *cynthia* larva do this, but I have seen *promethea* do it.

Three of the larvæ spun cocoons so small that they could not turn in them, so backed out, deserted them, and tried again. Their silk gave out and they pupated without any cocoon, but not perfectly.

In my experience *cynthia* larvæ will not eat wild cherry if they can get anything else, and I have had whole broods starve rather than eat it. These hybrids preferred it to everything else, except some of Miss Eliot's lot, which took sassafras. Ailanthus I did not have to offer them.

One ♀ *cynthia* mated ♂ *promethea* but laid no eggs until mated with ♂ *cynthia* after which she oviposited abundantly. The larvæ were typical *cynthia* in appearance, but chose wild cherry for food and spun small, slender cocoons like *promethea*.

Accidentally three boxes containing these larvæ, just ready to spin, were put aside reversed, so that the twigs and leaves arranged for normal spinning were upside down. Each of the six larvæ spun a normal cocoon, fastening the leaf-stem to the twig as if the twig were uppermost, and wrapping the leaf around the cocoon as usual. Yet the spinning had not begun when the boxes were set aside.

Early in August I found hundreds of *Dryocampa rubicunda*

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

DR. P. P. CALVERT secured a valuable lot of insects on his recent trip to Mexico. These are in addition to the Odonata to which he gave especial attention.

WE have recently had a pleasant visit from Mr. T. N. Willing of Regina, Saskatchewan, Canada. He is doing good work in creating an interest in entomology in his district, and is an enthusiastic collector, particularly in Lepidoptera and Coleoptera.

HIGHER CRITICISM.—Ascum—"So you don't believe the story of the fall of man?" Doubter—"Not altogether. I don't believe there was any serpent, although Eve may have honestly thought so. It was probably just an apple worm which her fear magnified."

"CHIGGERS." LEPTUS IRRITANS AT CINCINNATI, OHIO.—Ten years ago these pests were unknown to me in this locality. Now they have become numerous and exceedingly aggressive. While at work in a thicket, June 30th, digging up an ant hill and sifting it, I secured a fine collection of them, without any effort on my part. I find a preparation called "Libradol," made by Lloyd Bros., Cincinnati, Ohio, a very effective and instant relief from the irritation, while a little carbolated vaseline quickly heals the pustule which they cause.

"Here's to the 'chigger,' who grows no bigger
Than the point of a pin.
The lump that he raises, itches like blazes,
And there's where the *rub* comes in!"

—CHARLES DURY.

PRELIMINARY ANNOUNCEMENT OF ANNUAL MEETING OF ASSOCIATION OF ECONOMIC ENTOMOLOGISTS.—The Nineteenth Annual Meeting of the Association of Economic Entomologists will be held in New York City on Friday and Saturday, December 28 and 29, 1906. More details concerning the exact place of meeting, hotel accommodations and railway rates will be given at a later date.

It is desired to make this meeting the best in the history of the Association, both as to attendence and number and quality of the papers presented.

Reports of the Committees on Nomenclature, Testing of Proprietary Insecticides and on the National Control of Introduced Pests will be presented for the consideration of the Association. If possible, a symposium will be arranged on Insect Legislation.

Kindly forward at once the titles of papers you may wish to present. It is suggested that a brief abstract of each paper be sent to the Secretary, as this can be used by the press and will make the reports of the meeting more valuable.—A. H. KIRKLAND, President, No. 6 Beacon St., Boston, Mass.; A. F. BURGESS, Secretary, Capitol Bld., Columbus, O.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., DECEMBER, 1906.

To avoid the annoyance and trouble of collecting subscriptions and keeping accounts in the future, all subscriptions to this journal will be exacted in advance and the publication will be stopped at the expiration of subscriptions. This rule will apply to everyone and no exceptions will be made. Subscription blanks will be placed in this issue for the benefit of those who have not paid for the coming year. These blanks will also be found in the copies of those who have already renewed for 1907, and are not to be considered bills.

Another change will be made in the coming volume: a number for July* will be published, but none for August or September. There is not the same necessity for the journal during the hot collecting months. We will continue to improve the NEWS in every way and expect to make it the best journal of its kind in the world. We are constantly receiving commendatory letters for our efforts in this direction. Our subscribers and well wishers can aid us greatly by helping to increase the subscription list, as this will aid us to improve the journal for all interested.

RHABDOPHAGA RIGIDAE.—I am much pleased to see the excellent descriptions and figures of Cecidomyiidæ in Dr. Felt's report for 1905, just issued. I notice on p. 122 that *Rhabdophaga rigidae* appears as a "new species," on the ground that Osten Sacken knew only the gall. It may be as well to state, therefore, that in *Entomologist*, 1890, pp. 278-279, the gall, larva, pupa-shell and imago are briefly characterized.—T. D. A. COCKERELL.

*Since the beginning of the Journal no numbers for July and August have been published.

and varieties are divided into three categories; the geographical, the seasonal and the individual variety. Subspecies is used in the sense of essential variety, incipient species or geographical race. It is just here that the personal equation comes in and we are of the opinion that this work expresses fairly well the relative value of these forms, or as well as may be at the present time, with the knowledge at hand. It will probably be of interest to our readers to speak of the treatment of the species found from Mexico northward. The name *ajax* is dropped and our species becomes *marcellus marcellus* Cram.; *marcellus floridensis* Holland; *marcellus telamonides* Feld.; *marcellus lecontei* Rothschild and Jordan; *philenor philenor* L. and *philenor orsua* Godman and Salvin. *Machaon aliaska* Scudder, does not differ in any essential way from the Asiatic specimens. We have examples from Eagle City, Alaska, and Sikhim that are identical. *P. polyxenes* becomes *polyxenes stabilis* Rothschild and Jordan; *polyxenes asterius* Cram.; *polyxenes polyxenes* Fab., and *polyxenes brevicauda* Saund.; *pergamus* is given subspecific rank. *Cresphontes* is considered distinct from *thoas*, and the latter becomes *thoas antocles* Rothschild and Jordan. *Troilus* is divided into *troilus troilus* L., and *troilus texanus* Ehrm. *Glaucus* becomes *glaucus glaucus* L. and *glaucus canadensis* Rothschild and Jordan. We may mention a few cases where there is much warrant for a difference of opinion in regard to the standing of varieties. *P. glaucus* might be more logically divided into three forms, the very large and dark Florida form being of equal value to the boreal. The Cuban *polyxenes* shows almost no difference of moment from specimens found in the United States, the latter varying to a wonderful degree. Variety *curvifascia* is said by the authors to occur from New Mexico, to Vera Cruz, Guatemala, and West Mexico, a topomorph covering a great extent of territory, yet it is not given subspecific value. It seems to differ to a greater degree from *asterius* than does the Cuban *polyxenes*. *Papilio bairdi* is given specific rank which is very doubtfully the case. It seems much more nearly related to *polyxenes* than is *americus* Kollar. Variation has not been sufficiently studied to permit of an exact nomenclature, and the values of varieties are by no means parallel, and at present it is psychological so far as the individual observer is concerned. The authors had a wealth of material for study, and the work shows the general result of this in its broad treatment. The *thoas* group represents a special study and a rather large number of names are proposed. We are inclined to think many more names could be applied to some of the other species on the same principles. Perhaps this would invalidate the argument on page 429 in favor of trinomials in preference to citing localities, as the locality would be more indicative of what is meant than a name, which often indicates an inappreciable difference, difficult or almost impossible to express in words. Such works undoubtedly cause an increased interest in the group or groups treated and mooted points are more likely to be elucidated thereby.—H. S.

UNDER the name *Eurypodea fredericki* Edw. A. Klages has described a remarkable beetle from Suapure, Caura Valley, Venezuela, belonging to the group Copres. The single sheet description was published by the author.

Entomological Literature.

TENTH ANNUAL REPORT OF THE STATE ENTOMOLOGIST OF MINNESOTA. —Fourth Annual Report of F. L. Washburn. The Diptera of Minnesota. This is a work of one hundred and fifty-five pages and contains two plates in color; the second plate is appropriately numbered as to the names of the species and the first is not. There are also one hundred and sixty-three line and half tone cuts, which are mostly very good. The first fourteen pages are devoted to an account of the Diptera, their economic importance and their anatomy. Then follows a synopsis, after which the body of the work is made up of an account of the families and species inhabiting Minnesota. The work will be very valuable to the people of the State who care to use it. As a popular treatise on the subject it will also be useful to the many entomologists who do not make a special study of the Order.

A REVISION OF THE AMERICAN PAPILIOS.*—By the Hon. Walter Rothschild, Ph.D., and Karl Jordan, Ph.D.

This is a work of 333 pages, with six plates and fifty-nine figures, and covers North and South America and the adjacent islands. It shows very great reseach into the literature of the subject and we presume the nomenclatural opinions of the authors will be largely followed. There has been no attempt to divide the species into "up-to-date" genera, although this is promised later. We believe the authors are unusually qualified to do this in a scientific way as they say "classification has always suffered from the habit of systematists of studying the systematics of a district rather than concentrating their labors on certain families taking into account all the species of the globe." We again quote as follows: "The most interesting general result of our researches is perhaps the demonstration of geographical variability in secondary sexual characters apart from the genitalia. The occurrence of such variability is of great bearing on systematics, since many authors consider secondary sexual differences to be of generic value." It should not be forgotten that there are two sexes in insects and the student is not unlikely to have or obtain but one and a unisexual classification won't help him materially, especially in families where there is considerable antigeny. There is much food for thought of very considerable interest in the preface. The work as a whole is excellent, and while it is quite possible to take exception to the standing accorded a number of forms, the subject is one of great difficulty and our knowledge at present too limited to speak dogmatically on the subject. Trinomials are used

* Novitates Zoologicæ, xiii., No. 3, August, 1906.

'GLI INSETTI, LORO ORGANIZZAZIONE, SVILUPPO, ABITUDINI E RAPPORTI COLL'UOMO.—By Prof. Antonio Berlese, Director of the Royal Station for Agricultural Entomology in Florence. Milan, Societa Editrice Libraria, 1906. Published in parts at one lira each.

With such excellent recent general American books on insects as those of Kellogg and of Folsom, it would seem difficult for a book in a foreign language to meet any great demand in this country, yet the admirable work of Professor Berlese, of which seventeen parts have already been published, will undoubtedly prove a very important addition to the libraries of all institutions in which advanced morphology is being studied and in all laboratories in which the study of insects is undertaken from any point of view.

Berlese is a master, a man of broad ideas, thorough training, admirable in technic, clear in demonstration, an excellent writer, and a capable draftsman. His work when completed will be both sound and comprehensive. It will comprise two volumes, of which the first will in a general way contain the anatomy, and the second the biology of insects. The first volume will consist of from seven to eight hundred pages, and will be accompanied by about one thousand figures. Of these, 550 pages have been published in seventeen parts, and the printed parts contain six hundred figures and four plates.

The subjects considered in the first volume, by chapters, are: I. Brief history of entomology; II. Size of insects; III. Plan of the insect structure; IV. Embryology in general; V. Morphology in general; VI. Exoskeleton; VII. Endoskeleton; VIII. Muscular system; IX. Integument and its structure; X. Glands.

There still remain to be published chapters on the nervous system and organs of sense, organs of digestion, organs of circulation, organs of respiration, organs of secretion, and sexual organs. In the part already completed, the chapters on morphology are marvels of detail and thoroughness. The work itself is a large octavo, and more than ninety pages are devoted, for example, to the study of exoskeleton of the head, while nearly eighty pages are occupied with the treatment of the muscular system. Nearly all of the numerous and strikingly apt illustrations are original, having been drawn by Dr. Berlese himself. Each section of the work is followed by a very complete bibliography, and the author has shown a perfect knowledge of the work of other men, the publications of American authors having been considered and studied with a thoroughness quite unusual among European authors.

The second volume, which has been reserved for the treatment of biology of insects, will contain a careful consideration of all questions of economic importance, and it will undoubtedly be of interest to learn from this work Berlese's final views on the subject of parasitism, and especially the relations of insects and birds, upon which point he has long been at odds with other Italian zoologists.—L. O. HOWARD.

Doings of Societies.

At the meeting of the Feldman Collecting Social held September 19, 1906, eight members were present and Mr. Harry Kaeber visitor. President Daecke in the chair.

Mr. Wenzel stated that he had received a postal card from Professor Smith from Brussels wishing to be remembered to the boys.

Mr. Harbeck spoke of *Tenodera sinensis* having been raised at Logan. Mr. Schmitz remarked that he also raised the said species at West Philadelphia, and that he saw imagos in his yard up to about September 1st.

The insects exhibited by Mr. Schmitz at the last meeting were identified as *Aleurodes vaporariorum* Westwood. They were found on scarlet sage, of which they had entirely denuded the foliage.

Mr. Wenzel exhibited work in white pine of *Tomicus pini* and *Pityophthorus sparsus*, collected by H. Wenzel, Jr., at Pocono Mountain.

Mr. Harbeck reported that the collecting season was very promising up to July 15th, since which time it has been poor.

Mr. Daecke exhibited a specimen of *Evetria comstockiana* which he bred from a pine rosin tube. He also exhibited a specimen of a *Pimpla* (*Calliephialtes*) n. sp., bred from a similar rosin tube which is evidently parasitic upon *Evetria comstockiana*.

Mr. Daecke exhibited specimens of *Rhicnoessa albula* taken at Stone Harbor, N. J.; one specimen was mounted on white ocean sand, from which it was difficult to distinguish with the naked eye.

FRANK HAIMBACH, *Secretary*.

At the meeting of the Feldman Collecting Social held October 17, 1906, at the residence of Mr. H. W. Wenzel, 1523 South 13th Street, Philadelphia, there were eight members present. President Daecke in the chair.

Mr. Haimbach read an extract from a letter received by him from Miss Annette F. Braun, of Cincinnati, Ohio, referring to her observations of the Life History of *Tenodera sinensis*.

Mr. Laurent reported the capture of *Pamphila phylæus* at Mount Airy, Pa., which he said is the second record of capture of this species for eastern Pennsylvania. He also reported capture of *Catocala concumbens* in Pike County, Pa., which is second record for the State of Pennsylvania.

Mr. Laurent also stated that in the northeastern part of this State, locust trees as well as golden rod grow profusely, but he had not seen any specimens of the locust borer *Cyllene robiniæ* in the past season, while in the southeastern part of the State the trees were much infested and the insect common.

Mr. Wenzel read from Dr. Hopkin's paper on the life history of *Cyllene robiniæ*.

Mr. Harbeck reported the following Diptera new to New Jersey: *Frontina aletiæ* Riley taken at Anglesea, June 11, 1905; *Acemyia dentata* Coq. taken at Lucaston, September 9, 1905, and *Brachycoma sheldoni* Coq. taken at Trenton, May 23, 1906.

Mr. Harbeck also reported capture of *Frontina setipes* Coq. at Germantown, Pa., September 24, 1905, described from Brookings, South Dakota.

Dr. Castle exhibited specimens of *Pachyscelus purpureus* Say, taken at Glenolden, Pa., and stated that his earliest record is April 29th and latest spring record June 12th, and that he found the insect common again on September 21st, which proves conclusively that there is a second brood.

Mr. Haimbach exhibited his collection of the Genus *Crambus* taken in Philadelphia, Pa., and southern New Jersey, numbering 22 species, one of which, *satrapellus*, being new to New Jersey list and one probably new to science.

Mr. Daecke exhibited a ♂ *Mydas fulvifrons* Ill. and a ♀ *Mydas chrysostoma* O.-S., which were taken in coitu at Stone Harbor, N. J., thus establishing the synonymy of *chrysostoma*. He also stated that the new record for New Jersey of *Chrysops sordidus* O.-S. (meeting of June 27, 1906, published ENT. NEWS, Oct., 1906) is erroneous, it should read *Chrysops cuclux* Whitney. There is no reason, however, why *Chrysops sordidus* O.-S. should not be found in New Jersey.

FRANK HAIMBACH, *Secretary*.

Entomological News

AND

PROCEEDINGS

OF THE

ENTOMOLOGICAL SECTION

OF THE

Academy of Natural Sciences of Philadelphia.

VOLUME XVII, 1906.

EDITOR:
HENRY SKINNER, M. D.
PHILIP P. CALVERT, Ph.D., Associate Editor.

ADVISORY COMMITTEE:

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PHILADELPHIA:
ENTOMOLOGICAL ROOMS OF
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.

1906.

P. C. STOCKHAUSEN
PRINTER
53-55 N. 7TH ST., PHILADELPHIA.

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